



Aalborg Universitet

AALBORG UNIVERSITY
DENMARK

State-of-the-Art Literature Review on Video Data Management and Video Data Life Cycles

Otrell-Cass, Kathrin; Antonsen, Thomas Wesley

Creative Commons License
CC BY-NC-ND 4.0

Publication date:
2018

Document Version
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

Citation for published version (APA):
Otrell-Cass, K., & Antonsen, T. W. (2018). *State-of-the-Art Literature Review on Video Data Management and Video Data Life Cycles*. Department of Learning and Philosophy, Aalborg University.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- ? Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- ? You may not further distribute the material or use it for any profit-making activity or commercial gain
- ? You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

STATE-OF-THE-ART LITERATURE REVIEW ON VIDEO DATA MANAGEMENT AND VIDEO DATA LIFE CYCLES

Kathrin-Otrel-Cass & Thomas Wesley Antonsen

Department of Learning and Philosophy

Aalborg University

1. INTRODUCTION

This state-of-the-art presents a literature review on video data management. This includes an examination of methodological approaches to data collection with video, documentation and metadata processes, ethical and legal compliance, storage and backup issues, selection and preservation, data sharing, responsibilities and resources. While video as a means for data collection is used by scientists in a number of fields this review has concentrated its focus on educational research, since the method is frequently used and requires careful considerations to do with the collection and analysis of sensitive data.

2. DATA COLLECTION

Educational research that utilises video data involves typically the collection of more data than only video files. Materials including photos, interview transcripts, audio recordings, field notes from observations, metadata documents, data management documents, research plans and ethical materials including templates and filled in letters of informed consent are part of the data materials of such investigations. In the letter of informed consent the researcher declares his intentions, the aim of the research and details how participants will be involved. Explaining risks, benefits and rights is part of this document and only when the participants agree and confirm their permission and the conditions for participation through their signature can the informed consent be collected and kept safe (Heath, Hindmarsh, & Luff, 2011).

Not all, but much of the video based research is used to produce ethnographic accounts of educational practices. According to Pink (2013) video ethnography is about the encounter between the lived and performed life, and the event of doing research invites to engage and move forward with it, rather than going back in time and place in the production of new knowledge (Pink, 2013).

Video records are used to capture practices in situ and have (framed) raw data to get back to for future investigations including also for the joint analysis of such data. Sometimes videos and field notes are combined and at times these combined materials are viewed together with the participants, adopting a reflexive approach by visually prompting the recall of events (Pink, 2013). Joint viewing may again be recorded which can offer new opportunities for knowledge production, creation of meaning or the development of arguments. Tobin and Hsueh (2007) expand on this to say that video ethnography should be about “provoking self-reflection, challenging assumptions, creating things of beauty, entertaining, and giving pleasure” (p.77).

Using multiple camera angles and installations such as handheld and/or fixed cameras can provide the researchers with additional information about classroom interactions (Goldman, Pea, Barron, & Derry, 2007). In educational settings, it may be of interest to make observations of students and teachers participating in activities in different physical locations, which means that video cameras may not to be mobile and follow where those activities occur, making it easier to piece together interactions between the participants (Heath, Hindmarsh, & Luff, 2011). Therefore,

using more than one camera can help frame different activities taking place. Following up such observations with in/formal interviews to ask for reflections from teachers and students can supplement missing pieces of information or correct impressions.

It is also important to consider who collects the data (Heath, Hindmarsh, & Luff, 2011), and who is involved in the analysis processes, because participants need to be informed about this and different members of the research team may require specialised training. To gain a deeper understanding of observations in educational settings, the data analysis could include initial reflections by and with teachers, students and researchers after the classroom observations. Such reflective conversations in retrospect may begin with an assertion, followed with telling examples from observations or interview/discussion excerpts. These conversations seek to create knowledge production from the viewpoint of participants in an active collaboration with them (Pink, 2013). The analysis process could also involve teachers' post lesson reflections and feedback from pupils to inform the selection of sequences of video from the classroom observations. Asking participants to join a viewing session of video data could elicit significant information about and interpretations of their perspectives on and understanding of what unfolds in the video. Certain actions could be unclear to the researcher therefore; getting an idea on how participants parse the events may strengthen the meaning-making process and the knowledge production. Viewing sessions could be a productive approach to the gathering of further data for analysis. Such secondary interpretations, convert the original collected data into a process of data reconstructions (Jordan & Henderson, 1995). Video selections are typically a focus of scrutiny by the researcher where analytical software programs allow for analysis process and becomes a central information source in the meaning-making process at a micro-level (Erickson, 2006). This process of data collection and analysis aims to describe the social construction of knowledge when pupils are involved in science teaching and learning in a particular physical environment.

Using a data management plan for planning the collection, processing, analysis as well as archiving and dissemination of project data before data comes into existence are conditions of good research practice (Jacobs & Humphrey, 2004). In order to control data capture field observers should undergo training before collecting data with video, audio, photo and field notes. The data collection process may also include considerations regarding quality assurance procedures (QA) in order to ensure best practice throughout the entire duration of the project.

DOCUMENTATION AND METADATA

In order for the data to be discovered, understood and thence reused by other researchers; the entering of descriptive metadata in both files and video data provides structured information on formal, technical and content related features and should as a minimum include information such as title, author, file size, duration, subject area, abstract and keywords (Strobel & Marín-Arraiza, 2015). This is important when it is anticipated that the video data is to be handled by people other than those directly involved in the collection. It ensures not only the availability but also the usability of research data collected (Jacobs & Humphrey, 2004). Therefore, it is crucial to create as accurate metadata as possible using effective metadata schemas to accompany the research data (Derry et al., 2010). This is because once captured and edited, video can be manipulated to assist interpretation, for example by slowing down or zooming-in. It raises issues about how to consider the production history, original purpose and intended audience. Therefore, metadata may also include information on the methodology used to collect the data, analytical and procedural information, definitions of variables, units of measurement and any assumptions made. Video data management may also include that a variety of descriptive and rights-related parameters such as copyright information, contractual usage restrictions, time codes and content connected scripts or transcripts have to be added in a document explaining this. Digital asset management systems e.g. PBCore has a vocabulary of 48 categories easing the retrieval of content and it's possible to index as free-form text as well as structured metadata (Goldman, Pea, Barron, & Derry, 2007).

Creating the metadata manually ensures high reliability since it allows for the retrieval of relevant search items (Strobel & Marín-Arraiza, 2015). However, manual addition of metadata to video material may not identify all parts of the video while automated metadata generation will achieve this. A combination of manual and automated metadata handling may therefore be a good solution (Strobel & Marín-Arraiza, 2015).

Entering metadata early in the process helps managing the data during the life cycle of the project. A further help in handling metadata might be to structure them according to the phases of the project. Lesli Scott (2016) suggests four phases for structuring and handling metadata. These consist of capture (metadata obtained in the collection of video data and the information obtained from ethnographic fieldwork); ingest (the process of creating metadata as video files are being uploaded to local or external servers for dissemination); coding (adding metadata on the quantitative and qualitative data created by the researchers); and finally, archiving (ensuring that metadata are stable, structured and shareable when placed into long-term preservation systems). Using effective metadata schemes in each phase of the coding of metadata can establish broad applications of metadata for video analysis.

Metadata standards could include CERIF standards, which is the Common European Research Information Format recommended by the EU to its member states (Jeffery, 2007). Dublin Core is one of the most widely used metadata standards and is organised into four levels of interoperability. Which level to choose depends on the needs requirements. Most metadata operate at level 1 where term definitions are shared in natural language. This could be in environments such as library systems, intranet and repository federations. Level 2 is concerned with interoperability where shared vocabularies are based on formal semantics supporting Linked Data that are widely used by search engines such as Google, Bing and Yahoo. Levels 3 and 4 are still in development and less common in practice inasmuch as they are not yet as well supported by software tools (Dublin Core Metadata Initiative, 2009).

ETHICS AND LEGAL COMPLIANCE

Using video for the collection and analysis of visual, verbal and written communication and interaction presents researchers with ethical challenges that need consideration prior to the data collection. Participants involved in video based research have to give their consent prior to the data collection. Therefore, the formulation of a letter of informed consent should be sent to participants. In educational settings, this would usually include principals, teachers, students and their parents. Participants should receive information about the aims and purpose of the project, the nature of their involvement (or their children), their rights e.g. to withdraw the informed consent, details on who to contact and what benefits they could get from participating. However, in order to ensure that there is a shared understanding embedded in the relationship between the researcher and participants, it may require that the consent form needs revisiting, negotiation and sometimes renegotiation on an ongoing basis. This ensures that participants are fully informed e.g. if the situation of a participant changes months or years later (Pink, 2013; Jordan & Henderson, 1995). Furthermore, collecting video data involving children raises additional issues regarding to which extent they are truly informed about and deeply understand the aims and purpose of the project in regard to the children's capability to make judgement. Therefore, in order to gain children's permission, it may be necessary to obtain informed consent from involved groups people such as, parents, teachers and classroom assistants (Heath, Hindmarsh, & Luff, 2011).

Another ethical challenge concerns the anonymity of the participants. Discussing these issues with participants to find a procedure they will be happy with, is a transparent way of finding a solution to anonymity issues (Heath, Hindmarsh, & Luff, 2011). Those who identify that they do not wish to be included in the project, will need to be identified by the researchers but not recorded so that precautions can be taken that they are not filmed. In case they do appear in material it is necessary to identify relevant scenes and then to either edited them out of the footage or to blurr images/voices to preserve people's anonymity in the best way possible.

The sharing and use of data creates challenges regarding the rights of participants and professional codes of conduct especially when it comes to the protection and anonymity of the participants if data is being shared or re-used e.g. by other researchers (Goldman, Pea, Barron, & Derry, 2007). Talkbank suggest nine levels of data access from full to no access (Talkbank, n.d.), of which participants can either approve or disapprove. The benefit for seeking approval of using data beyond the duration of the initial project gives other researchers the possibility of developing further analysis and publications (Heath, Hindmarsh, & Luff, 2011) or perhaps make historical comparisons of certain practices. However, it also raises issues that go beyond the researcher's control of the shared material e.g. the possibility of videos going viral and thus being shared unintentionally beyond the intended audience (Pink, 2013). Therefore, the consent form should state that material will not be passed to third parties without an agreement that they will follow the same procedures in handling and storing the data. In the case of educational research this should also include parents who may wish to have a copy of their children's performances at school. Consideration on storage and archiving raises essential ethical issues. Material that is not used for research purposes has to follow the same strict ethical guidelines as above but may not have the same obligations in storage or sharing of video data, and for example may be shared through platforms like Edumedia2 for teaching purposes (e.g. teacher training).

Consideration on how to manage copyright and Intellectual Property Rights (IPR) issues is also of great significance when collaborating with participants in research projects. This particularly significant since the introduction of the EU General Data Protection Regulation (GDPR) in 2018 (<https://eugdpr.org/>) that governs the processing (holding or using) of personal data. One of the main aspects to familiarise with is that GDPR regulates data about living people from which they can be identified, as well as data that is unique to an individual (name, date of birth, name of school, etc). It should be noted that even when video data has been pseudonymised but where dataset and identifiers are held by the same organisation, is still personal data. Throughout the duration of a project and the subsequent time, the ownership of the recorded video data passes from the participants who own the raw data material, to the researchers who own the analyzed data. Even though ownership of raw data belongs to participants, it does not give them right to use the material as they please as this can have implications on other participants (Pink, 2013). However, if video data is shared with other researchers, this cannot take place without prior consent of participants and approval of the principal investigator to give permission to use specific parts of the data for further analysis and subsequent sharing. Subsequent research will need to comply with the original research aims and the specific agreements made with the participants. Research agreements may include that funding bodies have access to video material for promotional purposes but only of material that shows individuals who have given informed consent for such purposes.

STORAGE AND BACKUP

Setting up an infrastructure that satisfies secure storage solutions and online sharing options for video is another key aspect in dealing with video data for research purposes. Creating a data management plan (see for example in Denmark <https://dmponline.deic.dk/>) structures the procedures for storage and backup early in a project to incorporate a schedule for depositing data products over the course of a project's life cycle and beyond. Jacobs and Humphrey (2004) suggest that archiving is a process that should be incorporated as part of the research plan. Such a plan should be aligned with the tenets of the Danish Code of Conduct for Research Integrity (Ministry of Higher Education and Science, 2014). The Code emphasizes and recommends standard practices for proper data management, focusing on the guarantee for credible and transparent research. This includes who (researchers, institutions) is responsible for storing and managing primary material and data records, such as allowing results to be assessed, to what extent and for how long period of time the data can be retained, the physical and technical possibilities and responsibilities for providing secure storage and retention policies consistent with confidentiality requirements, guidelines, consent e.g. avoiding conflicts with contractual legal obligations. Jacobs and Humphrey (2004) argue that simply storing data does not constitute preservation or ensures usability. However, data archives

should be equipped for storing, preserving and providing access to the metadata that the research data is accompanied with.

Today, cloud platforms and social media such as Delicious, Dropbox, Google Docs have become a means of archiving, in addition to storing data on external hard drives (Postill & Pink, 2012). However, those platforms have limitations in terms of security. In Denmark Edumedia2 can be accessed by researchers and scholars using WAYF login, however the platform is best used for sharing small edited episodes, including for educational purposes. Goldman, Pea, Barron, and Derry (2007) distinguish between three storage approaches: Online storage, which provide instantaneous access to significant amounts of data e.g. platforms such as Kaltura. Nearline archiving, where data is stored on remote servers for archival and short-term storage and can be retrieved automatically when needed, for instance on University servers. Offline archiving is for content that is no longer required such as data backup and raw data material, accessing the data from remote archival libraries is done manually and thus becomes more time-consuming. In this regard, Shen suggest that best practice for data backup is having three copies in storage, "the original files, a local external copy, and a remote external copy" (Shen, 2016).

It is important to define your needs and requirements for archiving different kinds of data material such as video (raw video, analyzed video), written text and photographs and is data to be stored on external encrypted hard drives or onto a University server space for more secure long term storage. These definitions should happen in a combination with the recommended standards for proper data management e.g. with regard to confidentiality requirements. This ensures to some extent that each type of data material is archived, preserved and stored properly (Pink, 2013). For faculties to have policies for data management may lead researchers to a better understanding of data management issues such as "description and documentation, sharing and publication, policy and planning, quality control and security, as well as copyright and licensing" (Shen, 2016).

SELECTION AND PRESERVATION

The costs of digital storage is decreasing significantly, increasing the attractiveness of preserving media digitally e.g. by using cloud services (Yogeshwar, Martucci, Gupta, Fendt, & Venzie, 2006). This is as important as ever, as it's crucial to preserve various types of video data such as raw data, sharable data, analyzed data and accompanying metadata which require a vast amount of storage capacity. Which data to select for preservation depends first and foremost on determining whether or not legal rights have been obtained to do so (Gertz, 1999). In addition, Gertz (1999) emphasizes a number of criteria for the selection of data for preservation e.g. is the enduring value sufficient enough to justify preservation (long-term value for research, historic importance), which options are available for preservation and what are the costs and in this regard considerations on the monetary and intellectual value of the data (Gertz, 1999). The importance of preserving research data beyond the lifetime of a project is that it e.g. enables new discovery, new knowledge, reuse and repurposing if consent has been given. Therefore, in many cases it would be desirable to preserve video data for long periods of time if not indefinitely hence making metadata standards and documentation schemes play critical roles (Shen, 2016; Yogeshwar, Martucci, Gupta, Fendt, & Venzie, 2006). Therefore, preservation of extensive metadata becomes pivotal for long-term possibilities to preserve and access the data files thus called preservation metadata (Jacobs & Humphrey, 2004).

It's only recently that Danish Universities have begun focusing on long-term preservation of research data in terms of establishing coherent central information technology systems as backup for research data. Some of the reasons for this is that long-term preservation has been regarded as a resource-intensive service, is it necessary and does it even make sense to long-term preserve all kinds of data and also there is a lack of tools and legislative framework in this area (Thestrup et. al., 2013).

Other relevant activities include that for example the European Commission's Horizon 2020 (research and innovation program) work program for 2016 to 2017 is focusing on areas such as E-infrastructures including long-term

preservation of scientific data in a Pan-European context called the European Open Science Cloud (European Commission, 2016). An element in the program is the use of Data Management Plans detailing project generations, its accessibility for reuse and exploitation, curation and preservation.

Effective data preservation and open access for immediate and future sharing and re-use is a fundamental component of today's research infrastructures and Horizon 2020 actions. In this context, European research stakeholders make increasing use of cloud services to effectively handle such data (European Commission, 2016, p. 11).

Even though preserved data can be retrieved from cloud and other data repositories, and subsequently used in the future beyond the lifetime of a given project and by other researchers this will raise new questions and considerations. It is therefore important to have the overall agreements between the original principal investigator and participants in mind to ensure the ethical reuse of preserved data material prior to sharing video data and findings.

DATA SHARING

There is increased emphasis by research communities and federal agencies on the need for broad sharing of data sources within and across research communities (Derry et al, 2010). However, when it comes to video data it is important to consider how and with whom the video data can be shared and what restrictions may be necessary. Jacobs and Humphrey (2004) suggest that the data market should be based on the values of open and free access called the common-wealth market to enable shared transparency and the possibility for new findings and stress that treating data as property limits access to data and ultimately restricts interpretations and developments of ideas i.e. narrowing the scientific view. Having a common-wealth market based approach may enable cross-disciplinary data sharing and thus becoming a major advancement for research inquiry and scientific discovery in future research (Jacobs & Humphrey, 2004; Shen, 2016).

As previously outlined it is also crucial to have legal and ethical guidelines in mind, to deal with concerns to do with the rights and protection of participants appearing in the video data however these can also create barriers to open, free and broad sharing and reuse of video data for future scientific purposes. Later use of data materials in some cases could thus e.g. only be granted to other researchers based on an application sent to the principal investigator detailing the nature of the investigation as it to some extent could ensure both participants and researchers rights. A topic such as the anonymity of participants in video data presents distinct challenges for ensuring privacy. This is due to the fact that video material is inherently non-anonymous of nature. However, it is important that video data does not reside on researchers' shelves and hard disks (Derry et. al, 2010; Heath, Hindmarsh, & Luff, 2011). Minimizing and overcoming restrictions and thus increasing the possibilities of data reuse and sharing with other researchers can be done by de-identifying participants by using techniques to remove personal identifiers e.g. by masking, pixelating or blurring faces, voices and logos, removing names of participants and location of schools from video data and accompanying metadata (Derry et. al., 2010; Heath, Hindmarsh, & Luff, 2011; Shen, 2016).

RESPONSIBILITIES AND RESOURCES

It is important to detail who is responsible for the different activities during the process of capturing data, producing metadata, ensuring the quality of the data, storage and backup, archiving data, sharing data and thus also considerations concerning long-term preservation of data. The Danish Code of Conduct for Research Integrity is not a set of legally binding rules however, it provides a standard framework on areas such as responsibilities when conducting research. These standards are to be further specified with policies and procedures applying to specific practices within the individual institutions (Ministry of Higher Education and Science, 2014).

Jacobs and Humphrey (2004) express that responsibilities are not always assigned to relevant parties which result in e.g. a lack of research data regulation hampering the access and sharing of data and researchers curating their own research data without having specialist knowledge and not having proper storage facilities or funding for this nor having long-term commitment to preserve their data. Such problems can result in loss of data. To avoid loss, it is important to create data archives that are mandated, funded and staffed for preservation (Jacobs & Humphrey, 2004). It is also essential to establish whose overall responsibility it is to take care for the preservation of research data is it the researcher, the Institute, the Faculty or the University. Amongst researchers at Aarhus University for instance it has been common practice that researchers themselves are responsible for administering their research data (Thestrup et. al., 2013).

The absence in Denmark of common policies and facilities on topics such as the creation of a data management plans for educational research has been suggested to be a reason why it is left to the researcher to judge how to administer the handling of their research data, however this could also be based on scepticism about having centrally formulated policies, the so-called one-size-fits-all solutions (Thestrup et. al., 2013). Having standard frameworks such as The Danish Code of Conduct for Research Integrity may provide the necessary impetus for the formulation of individual institutional policies that are based on established practices within the individual fields of research. This could eliminate one-size-fits-all solutions and clarify who is responsible for the different activities, during and after the duration, of research projects using e.g. data management plans. The importance of creating such formulations, building synergies and making alignments, may be amplified in interdisciplinary collaborative research projects involving researchers from other institutions as local policies on areas such as responsibilities may differ (Shen, 2016; Witt, 2009).

In collaborative projects, it is also crucial to manage resources to identify how to carry out a project, including handling the data beyond the project's lifetime. This could encompass human resources e.g. to prepare research data for long-term preservation such as creating metadata that support interoperability and whether it is necessary to involve and educate service specialists such as archivists who has the managerial expertise to facilitate sharing and ensure long-term preservation on behalf of the researchers (Friedlander & Adler, 2006; Jacobs & Humphrey, 2004; Witt, 2009). Long-term preservation is quite resource demanding therefore, it is important to establish whether the institutions have the resources in terms of server capacity to preserve collections of research data on their own local servers or if they need secure remote external preservation (Corrall, 2012; Shen, 2016). Considerations about resources in terms of expenditures to e.g. preserve data locally and/or remote and for how long thus become important.

References

- Aarstrand, P., & Forsberg, L. (2010). Producing Children's Corporeal Privacy: Ethnographic Video Recording as Material-discursive Practice. *Qualitative Research*, 10(2), 249-268.
- Corrall, S. (2012). Roles and responsibilities: Libraries, librarians and data. I G. Pryor (Ed.), *Managing research data* (s. 105–133). London: Facet Publishing. Retrieved from <http://www.facetpublishing.co.uk/title.php?id=047562#>.
- Derry, S. J., Pea, R. D., Barron, B., Engle, R. A., Erickson, F., Goldman, R., ... Sherin, B. L. (2010). Conducting video research in the learning sciences: Guidance on selection, analysis, technology, and ethics. *The Journal of the Learning Sciences*, 19(1), 3–53.
- Dublin Core Metadata Initiative. (2009). *Interoperability Levels for Dublin Core Metadata*. Retrieved from <http://dublincore.org/documents/interoperability-levels/>
- Erickson, F. (2006). *Definition and analysis of data from videotape: Some research procedures and their rationales*. In J. L. Green, G. Camilli, & P. B. Elmore (Eds.), *Handbook of complementary methods in education research* (pp. 177-205). Mahwah, NJ: Erlbaum.

- European Commission. (2016). *Horizon 2020: Work Programme 2016-2017*. Retrieved from http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-infrastructures_en.pdf#page=29.
- Friedlander, A., & Adler, P. (2006). To Stand the Test of Time: Long-Term Stewardship of Digital Data Sets in Science and Engineering. A Report to the National Science Foundation from the ARL Workshop on New Collaborative Relationships–The Role of Academic Libraries in the Digital Data Universe (Arlington, Virginia, September 26-27, 2006). *Association of Research Libraries*. Retrieved from <http://eric.ed.gov/?id=ED528649>.
- Gertz, J. (1999). Selection for Preservation in the Digital Age. *Library Resources & Technical Services*, 44(2), 97–104.
- Goldman, R., Pea, R., Barron, B., & Derry S. J. (2007). *Video Research in the Learning Sciences*. Mahwah: Lawrence Erlbaum Associates.
- Heath, C., Hindmarsh, J., & Luff, P. (2011). *Video in Qualitative Research: Analysing Social Interaction in Everyday Life*. London: SAGE.
- Jacobs, J. A., & Humphrey, C. (2004). Preserving Research Data. *Commun. ACM*, 47(9), 27–29
- Jeffery, K. G. (2007). CERIF - The Common European Research Information Format. *ERCIM News*, 68, 17. Retrieved from <http://ercim-news.ercim.eu/images/stories/EN68/EN68.pdf>
- Jordan, B., & Henderson, A. (1995). Interaction Analysis: Foundations and Practice. *Journal of the Learning Sciences*, 4(1), 39–103. https://doi.org/10.1207/s15327809jls0401_2
- Ministry of Higher Education and Science (2014). *The Danish Code of Conduct for Research Integrity*. Copenhagen: Ministry of Higher Education and Science. Retrieved from <http://ufm.dk/publikationer/2014/the-danish-code-of-conduct-for-research-integrity>.
- Pink, S. (2013). *Doing Visual Ethnography* (3. ed.). London: SAGE.
- Postill, J., & Pink, S. (2012). Social Media Ethnography: The Digital Researcher in a Messy Web. *Media International Australia*, 145(1), 123–134.
- Scott, L (2016). *Meta Data for Classroom Videos: Examples from measures of effective teaching*. Presentation given at the eVIR project meeting 30th September 2016, University of Oslo.
- Shen, Y. (2016). Strategic Planning for a Data-Driven, Shared-Access Research Enterprise: Virginia Tech Research Data Assessment and Landscape Study. *College & Research Libraries*, 77(4), 500–519. Retrieved from <https://doi.org/10.5860/crl.77.4.500>.
- Strobel, S., & Marín-Arraiza, P. (2015). Metadata for Scientific Audiovisual Media: Current Practices and Perspectives of the TIB|AV-Portal. I E. Garoufallou, R. J. Hartley, & P. Gaitanou (Red.), *Metadata and Semantics Research* (s. 159–170). Springer International Publishing.
- TalkBank. (n.d.). *Ground Rules for Data Sharing: Levels for Data Access*. Retrieved from <http://talkbank.org/share/irb/options.html>.
- Thestrup, J. B., Kruse, F., Nondal, L., Dorch, B. F., Andersen, M., Blaabjerg, N. J., ... Knudsen, E. V.. (2013). Forvaltning af forskningsdata i Danmark. In *Deff-rapport: Forvaltning Af Forskningsdata I Danmark*. Retrieved from https://www.researchgate.net/profile/Asger_Larsen/publication/257493930_Forvaltning_af_forskningsdata_i_Danmark/links/0c960525553fd385a3000000.pdf.
- Tobin, J., & Hsueh, Y. (2007). The poetics and pleasures of video ethnography of education. *Video research in the learning sciences*, 77-92.

Witt, M. (2008). Institutional repositories and research data curation in a distributed environment. *Library Trends*, 57(2), 191–201.

Yogeshwar, J., Martucci, S. A., Gupta, B. R., Fendt, M. R., & Venzie III, F. M. (2006). *Methods and apparatus for archiving, indexing and accessing audio and video data*. Google Patents. Retrieved from <https://www.google.com/patents/US7035468>.